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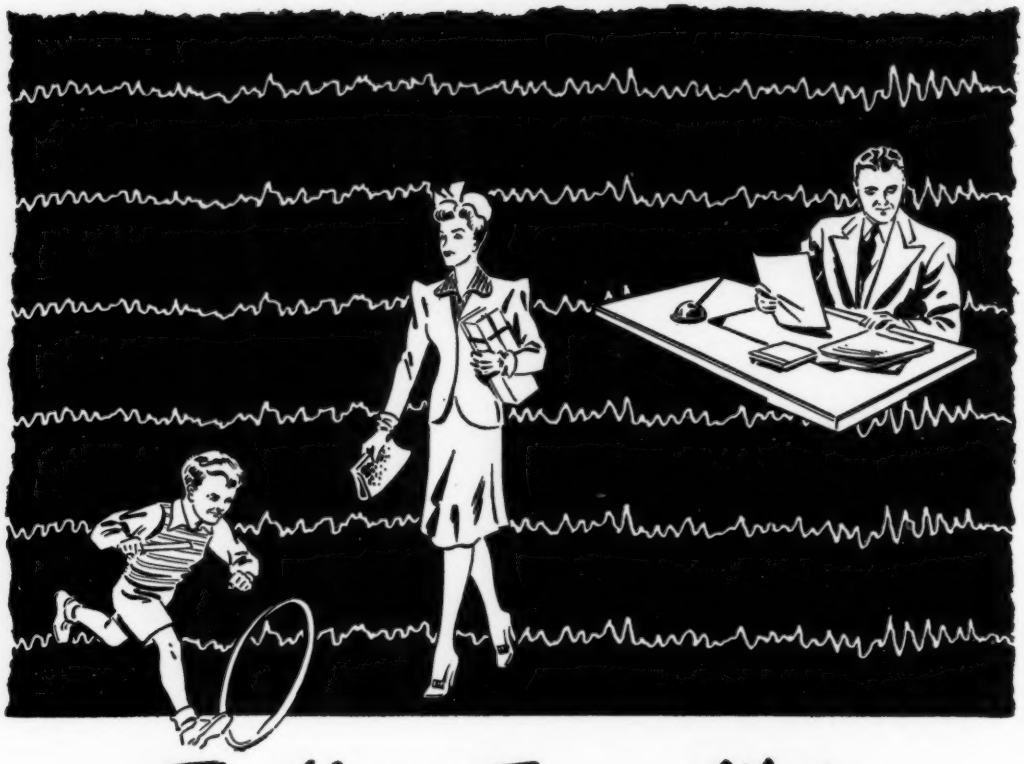

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MEDICINE'S NEW DAY

America's part in the post-war international scene is presently under voluminous discussion by many and varied agencies and individuals. It seems agreed that this nation must at long last accept a greater degree of interest and responsibility in world affairs. Few of wide vision will long dispute that, since the world has in effect become smaller and all peoples consequently closer neighbors, nations can no longer safely maintain the fool's paradise of isolation. Thought must be given likewise to the intramural program of America, come peace. And herewith is presented certain observations on one phase of the future.

Many thousand physicians are now in the armed services, practicing what is basically a preventive type of medicine. They are learning, as never before, the high value of prevention of disease and injury. Granted authority over the healthy and the sick such as they never possessed in civilian life, the Army and Navy doctors have strikingly demonstrated that the use of this authority by them has resulted in the fore-stalling of a high percentage of all types of illness and injury. Whereas in civilian life the doctor's services are rarely requested until actual disability is at hand, in military life he finds much of his time occupied with the anticipation and prevention of disease and injury. It takes more physicians to practice this kind of medicine than it does the civilian kind.

With millions of men and women in the armed services, becoming accustomed to seek out the physician before illness strikes, isn't it just possible that most of them will do likewise when they return home, come victory? In that case it is likely that we shall find that, in the production of doctors as in other lines of production, we have been operating on the false economy of scarcity. And it may well come to pass that doctors, like refrigerators, if the price and distribution be right, can and should be turned out in greater numbers than this nation has ever dreamed of. Should the quality of the physician to be in this post-war world remain high (and it will), and they be readily available to the entire population, then the day of the quack will wane. For there are few in America foolish enough to accept shoddy, second-rate goods or services if first class merchandise is concurrently available at the same or less cost.

Yes, there will be more work for more physicians, come Victory. Let no one bewail the dear, dead days—but keep his vision lifted. There is a new bright day dawning for all of us in this America.

FEE-TRIPLERS

As all know who read these columns, this writer is more than a little proud of his profession. But that warm regard does not necessarily hold for all members of this calling. Indeed, something more violent than mere dislike is presently our feeling toward the rotten apple in the barrel who, using the war as an excuse to fatten his bank balance, doubles and triples his fees, and thereby forces some of his patients to go without his services, or (worse) enter into a bidding contest for them. This sort of behaviour at best smacks of fake jewelry auctions, and at worst gives off an odor like a councilman's socks.

Medical societies would do well to snap a

bit and blinder on the few mules who persist in such a practice. There aren't many guilty —if there were this piece would not have been written, as an outraged Government would have by now entered the scene with corrective measures.

But "one rotten apple may spoil the barrel" you know.

General Considerations in the Treatment of Malunited and Nonunited Fractures

ROBERT G. PACKARD, M. D.
Denver, Colo.

IN the first place, about 95 per cent of all fractures may be reduced conservatively if seen early. And probably about 90 per cent of all fractures will heal well with good function if a few rules regarding proper reduction are adhered to. But there will always be some 5 per cent that require open reduction, and there will also be some 10 per cent that do not come out as well as we would wish because of malunion or delayed union or nonunion.

Now a malunited fracture by definition is a fracture healed in abnormal position or alinement, but a malunited fracture is not disabling per se. It is only disabling if function is disturbed. While it is true we do not welcome malunion, yet we must admit that a mild malunion as in a bowed femur or a short forearm with good function is far superior to one with accurate alinement and union when accompanied by poor function on account of lowered muscle tone, adherent tendons, or nerve or circulatory disturbance. However, we must if at all practical, insist on producing good weight-bearing alinement, overcoming too much shortening, as well as correcting unsightly deformity. And when a fracture is near a joint, we must be especially careful to secure as nearly an accurate reposition of fragments as possible as prophylaxis against a subsequent traumatic arthritis.

MALUNION

The causes of malunion in fractures can be summed up briefly as follows:

1. Failure of accurate reduction, particularly in Colles' fracture of the wrist and Potts' fracture of the ankle.
2. Improper immobilization. We should remember the old rule about including both the joint above and the joint below the break.
3. Too brief a period of immobilization, often because the patient is in a hurry to discard his apparatus.
4. Lack of frequent X-ray checking of the progress of healing, and the maintenance of reduction.

The treatment of malunion is essentially for restoration of function, not for correction of alinement alone. It is usually surgical, but as the late Dr. Campbell of Memphis said, surgery is rarely justifiable for cosmetic reasons alone. Let us mention the conservative methods first. Primarily, and particularly in cases where completely solid union has not occurred, a good deal can be accomplished by the wedging cast. This valuable method was originated by Lovett of Boston who applied a cast with or without anaesthetic to the bowed limb, then made a circular cut around four-fifths of the circumference of the cast at the site of the bowing, on the concave side, then he gradually over a period of days straightened the cast by means of inserting small wedges. Or a brace may be applied, particularly in the lower leg with a broad strap to exert a mild but firm and constant pressure against a mild angulation. Now as to surgical correction, first where the malunited fracture is not quite solid, one most valuable means is the application of skeletal traction. We are using this considerably these days and find it useful in many types of fracture of the long bones. It has many advantages over adhesive or skin traction in that it exerts a constant and greater pull, is not painful, and cannot be disturbed by the patient. It is also applicable where the distal fragment is short. Its only disadvantage is in cases of infection, or where the soft tissues have been lacerated or torn away.

(Read at the Annual Meeting of the New Mexico Medical Society, Santa Fe, June 26, 1942.

It is not quite so applicable in young children where the epiphyseal lines must not be disturbed.

In cases of completed malunion, of course the treatment is operative surgery. Our most valuable measure is osteotomy or refracture of bone. This osteotomy may be a simple breaking of the shaft of the bone or a cuneiform or wedge osteotomy, with removal of a triangular section of th shaft. The osteotomy is as rule not a complete division of the bone. It is usually best begun not by a chisel but by multiple drill holes and completed by manual force. After the osteotomy, adequate fixation for a sufficient length of time is insisted upon, following the correction or preferably a slight overcorrection of the alinement. The means of maintaining the adequate fixation is a matter of choice by the orthopaedic surgeon. Though a plaster cast alone is most frequently deemed sufficent, many surgeons feel that internal fixation of one type or another is indicated because of previous seemingly inefficient protection, or because skeletal traction is also desired. Skeletal traction is indicated particularly in such conditions as oblique fractures of the bones of the lower leg where overriding of the fragments is likely to occur. Here it is best accomplished by the insertion of a Steinman pin through the upper tibia or through the oscalcis, these pins all being incorporated in the cast. Likewise with the humerus a pin may be inserted above into the greater tuberosity and below through the supracondylar portion of the shaft or through the olecranon process. Pins may be used in the same manner in the femur. Some surgeons use the plate and screws after the method of Lane for adequate fixation of transverse fragments of the shaft of long bones. In this connection, the vitalium plate and screws are probably the best. Vitalium was introduced by Veanble, Stuck, and Beach of San Antonio, because it was found to be electroytically inert, and well tolerated by the tissues. It is an alloy of cobalt. chromium and tungsten. In oblique fractures, instead of using skeletal traction incorporated in the cast, some surgeons prefer the application of Parham or Collins bands, binding the fragments together to prevent their slipping by each other.

The best method of internal fixation is probably the bonegraft bridging across from one fragment to the other. It may be either the inlay bonegraft set in a trough of bone across the fracture site or the onlay graft set across the flat planed cortical surfaces of the two fragments. This will be described more in detail later in this paper. Other methods of fixation include simple nailing as in the case of a displaced malleolus of the tibia or a condyle of the humerus or femur. In fractures of the neck of the femur, a Smith Petersen flanged nail is used to secure adequate fixation after refracture and reduction.

Malunion occurs not only in the shafts of the long bones, but is often troublesome in some of the short bones, where the treatment requires other surgical measures as in the scaphoid bone or the semilunar bone of the hand or in the astragalus or the oscalcis of the foot. Here the malunion results not so much in malalinement as it does in exuberant callus and bone, producing a lack of complete motion because of bone block.

In malunited fractures of the oscalcis (and here the fracture usually becomes malunited) often a subastragalar arthrodesis is necessary for relief of pain. In the instance of the malunited scaphoid or semilunar bone of the hand, probably in most cases complete excision is best to relieve pain and stiffness because of bone block and traumatic arthritis. Such are the methods for the relief of malunion where the main objective is correction or improvement of dysfunction: for the most part refracture by osteotomy, accurate reduction, and proper fixation usually by internal fixation of one type or another; in other cases occasional arthrodesis or excision of the bone in part or in whole.

The treatment of malunion is essentially the same for all the long bones, but the element of weight-bearing in the lower extremity requires certain mechanical consideration. In the metatarsals we frequently have depressions or plantar bowing which are painful and require osteotomy to produce dorsal bowing. Subsequently a metatarsal pad is required. The ankle presents frequently a malunion with faulty weight-bearing following a Potts' fracture where the foot is displaced laterally and is in a position of valgus or flatfoot. Here the lower fragment or malleolus of the fibula overrides the shaft, and the internal malleolus of the tibia is displaced

laterally. Both malleoli must be refractured, the external one obliquely about three inches above its tip, and the internal one at its base, and the foot brought mesially so that the astragalus is squarely under the tibia. In the trimalleolar or Cotton's fracture (much more disabling) where the third malleolus or posterior edge of the tibia has also been fractured, and the astragalus dislocated backward with external rotation of the foot, correction is much more difficult. In addition to the osteotomies of the internal and external malleoli, the posterior edge of the tibia must be refractured, brought down into its proper place and nailed after reduction of the posterior dislocation of the astragalus. Often the tendo Achillis has to be lengthened. And sometimes arthrodesis of the ankle is the best solution. Malunion of the shaft of the tibia may be corrected by osteotomy and fixation by plate or bonegraft. Malunited fractures of the tibial condyles with depression of part of the articular surface make for relaxation of the knee, and are with difficulty corrected. After refracturing of the condylar fragment and tilting it upward, it is held in place by the insertion of a bonegraft into the wedge-shaped space left by lifting the condylar fragment. Or it may be better to secure the fragment by nailing. When the tibia is split by a Y fracture, little can be done for correction. In femoral condylar malunions, practically the same procedure is carried out after osteotomy and reduction, held by insertion of wedge graft or nail. Care must be taken not to injure the peroneal nerve as it travels around the neck of the fibula. Correction of faulty bowing of the femur may be readily obtained by osteotomy begun by drilling and completed by manual force. I feel that bonegraft here is not sufficient internal fixation but prefer the plating method, and a long spica cast. We make it a traction cast by adhesive straps to hold the lower leg to the cast and traction by peroneal straps incorporated in the pelvic portion of the cast, which may be held tight by adjustment of buckles. In severe cases skeletal traction may be used by pins driven through the trochanter and supracondylar region and incorporated in the cast. Plates may also be used in cases of malunion just below the trochanter. Fractures through the trochanter are best corrected by intertrochanteric osteotomy to correct a coxa vara where the angle of the neck with the shaft of the femur has become too acute. Malunion of the neck of the femur may be corrected by osteotomy or may demand some form of reconstruction of the hip which I shall try to describe under nonunion of the hip.

In the upper limb, we do not have to consider weight-bearing. Malunions at the anatomical neck of the humerus, if disabling, are best treated either by removal of the head, or better by arthrodesis of the shoulder for relief of pain. In cases of malunion at the surgical neck, usually no treatment is indicated, but in cases of marked dysfunction, osteotomy may be done and the arm held in a suitable abduction splint. In the upper third of the humerus, operative correction is seldom necessary. This is also true in the malunions occurring in the middle third, but in the lower third and supracondylar region, some form of osteotomy and internal fixation are required to correct a malposition of increased carrying angle or loss of carrying angle, in cases of malunion following internal or external condylar fractures. Unless severe, correction should not be carried out at all in children because of frequent decrease of function at the elbow, with limitation of extension and flexion, while in adults usually not enough correction can be obtained to warrant surgery. If surgery is considered indicated, an osteotomy may be done, and the condyle held by fixation by nail, but the patient warned that there will probably be some continued loss of function at the elbow. In the forearm, malunited fractures of the head of the radius are best treated by excision of the head. Likewise at the olecranon, experience has shown that removal of the fragment is better than trial at accurate opposition, but in malunion of the ulna, osteotomy is indicated with bonegraft or other fixation after proper alinement. When the fracture of the radius results in malunion in the shaft, the same procedure is indicated, but probably in cases of malunion in both bones, one graft should be done and an osteotomy of the other bone at the same sitting. Finally in cases of malunion in Colles' fracture where the articular surface of the radius points dorsally instead of volarly, the best treatment is usually a combination of osteotomy of the lower end of the radius with insertion of a graft in the space created by the osteotomy plus a resection of the styloid process of the ulna, or a shortening of the lower end of the ulna so as

to prevent restriction of motion resulting from abutment of the ulnar styloid against the carpus. Following this double procedure, a cast is applied holding the hand in flexion and ulnar deviation. Various operations are also reported in the literature for laxity or subluxation of the radio-ulnar joint at the writ.

NONUNION

Nonunion occurs in three per cent of all cases of fractures, most commonly in the leg but not infrequently in the humerus and the scaphoid and semilunar of the hand. Notorious for nonunion is the neck of the femur where Albee says that in spite of all the attention given to that part of the anatomy, not more than one-third of all hip fracures unite under any condition. Then there is a difference between nonunion and merely delayed union, although it is often only a degree. In the long bones, we cannot as a rule say definitely nonunion until six months. The occurrence of nonunion can rarely be blamed to other than local condition. Not often is there definite evidence of any constitutional factor. Henderson, Kellogg Speed, and Campbell studied the calcium-phosphorus index and found no abnormalities which had a bearing on nonunion. However, we must consider certain constitutional factors; I would list certain diseases as syphilis and Albers-Schonberk disease or marble bones. And we will admit that a not well understood embryologic deficiency prevents union in congenital fractures. Multiplicity of fractures is sometimes a cause. The main causes then are usually local ones. First we must mention inadequate reduction where good end-to-end approximation has not been secured, or where sufficient fixation has not been used. A frequent example of this occures in fractures of the radius or ulna or both bones where the cast has not immobilized both the wrist and elbow. Failure to include the elbow allows rotation of one fragment on the other on the slightest pronation or supination of the forearm, particularly the radius. Another frequent lack of immobilization occurs in oblique fractures of the tibia, for even though a good cast has been applied from the mid-thigh to the base of the toes, we often find on a check X-ray that one fragment of the tibia is gradually overriding the other fragments, because of some natural wasting of the soft parts of the leg or of a matting down of the sheet wadding or cotton underneath the plaster of Paris. Then adequate length of time of fixation has not been insisted upon. So often we like to please the patient by removing the support before our X-ray or clinical examination show sufficient solidity occurring. The lower leg should be supported at least eight to ten weeks.

Aside from proper reduction and adequate fixiation over a long enough period of time, we find a number of other factors responsible for nonunion. Malignancy, particularly that of metastasis, always spells defeat of union. Infection, as osteomyelitis from compound fractures, either prevents union altogether or at least delays it for a considerable length of time. On the other hand, in the end it may promote a much more solid union because of callous formation from increased irritation. Crushing injuries where the normal blood supply has been interfered with or where the blood has been forced into the surrounding tissues and where the periosteum or other connective tissue has been torn away, can be responsible for failure of union. Injury to the nutrient artery of the bone often destroys healing. This frequently results in selerosis of the ends of the bone fragments so that ultimate union is doomed. An example here is the manual scaphoid bone. Another common finding in nonunion is the interposition of soft tissue between the fragments which has prevented proper approximation.

Finally we must mention the factor of age as a cause of slowness or absence of union. We have listed all the causes we know. Yet in some cases of adequate reduction, seemingly sufficient fixation and a long enough time element, we find cases of nonunion where a pseudarthrosis results or where the bone ends simply melt away. Here various operative measures must be resorted to, some fo them very simple and minor and some very extensive. But before we resort to surgery in cases of delayed union, I would like to mention two conservative procedures. One is good old exposure to sunlight. I have found in a few instances that if we can cut a window in the cast over the site of the fracture down to the skin that sunlight has evdiently been the saving of union. The other procedure is the encouragement of some exercise to increase function that does not interfere with fixation. I refer to the encouragement of finger motion in cases of fractures of the forearm, not

only for the function of the fingers per se, but for the increase of blood supply to the part from the action of the fingers. Likewise, in slow union occurring in the bones of the lower leg, the establishment of weight-bearing as in a walking cast or in the application of a ring or semi-ring at the ischium, as a part of a snugly fitting caliper brace or leather brace, will frequently bring more blood to the part with resulting more callus. Similarly the use of the elbow and wrist in an arm abduction brace will help out much in slowly uniting humeral fractures.

SURGICAL MEASURES

Now for surgical measures. They are legion. We will review a few of the more popular procedures. To be effective good approximation is necessary, the fragments must be put into condition for bone repair, and adequate fixation whether external or internal is absolutely essential. Probably the simplest procedure is the drilling of the fragments. Years ago a man by the name of Brenard drilled six to twenty small holes obliquely from one fragment to the other across the fracture site to stimulate osteogenesis by increasing circulation and to carry particles of bone to act as minute grafts. Drilling is still done in selected cases. Either one of the fragments is exposed for one or two inches by stripping the periosteum away, and some half dozen holes are drilled across the fracture site, or the subcutaneous method is used; through stab wounds in the skin, drilled holes are made across the fracture. External fixation by cast or brace follows. But only in a few cases is drilling successful. Usually open surgery is necessary for the purpose of better preparation and approximation of the fragments. The fracture site needs to be exposed by proper incision, the fragments carefully examined for sclerosis, the bone ends freshened until good bleeding takes place, interposing muscle or fibrous tissue thoroughly removed, and the bone ends brought to snug approximation. If there is a loss of bone substance in one bone of the leg or forearm, it may be necessary to shorten the opposite bone so as to get approximation. If such defect does not require too much shortening in the opposite bone, the slack in the muscles can usually be depended upon to accommodate. Internal fixation must be used, and will be described later in this paper. In cases of separation of fragments of the patella or olecranon, the intervening fibrous tissue must be removed, the bone denuded, the fragments brought together, and accurately held by heavy chromic catgut, not wire. Sometimes excessive scar tissue in the skin or soft tissues shuts off proper blood supply and needs to be excised. Still another type of operation is used in certain other kinds of nonunion. For instance in the scaphoid or semilunar of the hand, much better function can be obtained by removal of the offending fragment or by excising of the entire bone instead of drilling across the fracture site or freshening the fragment surfaces. Arthrodesis of neighboring joints, as pointed out above is often the solution of choice when delayed union or failure of union occurs in fractures of the astragalus or oscalcis. Here a so-called subastragalar arthrodesis will terminate the painful traumatic arthritis, thus immensely lessening the disability.

These then are the general procedures in nonunion of the long bones; proper freshening and approximating of the fragments. Now what type of fixation can we depend upon? External fixation of old fractures is as a rule not enough.

We must depend upon some method of internal fixation. A choice may be made between metallic fixation and bone grafting. Both are good and can usually be depended upon if correctly carried out. Metallic fixation of course includes the plate, as brought out by Lane years ago, firmly attached across the fracture to the bone fragments by four or six screws, best used in transverse fractures, and the Parham or Collins band securely tightened around oblique fractures. Simple nails have their place in fastening condyles or malleoli to the long bones after properly freshening the surfaces, and the Smith Petersen pin through the cervical neck in hip fractures. In discussing metallic fixation, we must remember that not all metals have the same reaction on bone. Metals show various electrolytic reactions with varying deleterious effects on bone. In 1937 vitalium, an alloy of cobalt, chromium, and tungsten, was brought out and found to be practically inert and well tolerated by the tissues. It is now used extensively in plates, screws, and nails, and is proving very satisfactory.

In most fractures of long bones, particularly the tibia, radius and ulna, the bone graft is easily the method of choice. We have three dis-

tinct types of bone graft; the intramedullary, the inlay graft and the onlay graft. The first or intramedullary graft is taken from the cortex of the tibia, measuring about five inchs in length and three-eighths inch in width, and after the fragments have been freshened and the medullary cavities opened up and cleaned of any sclerotic plugs, is introduced into one medulla and then with extreme difficulty introduced into the other. Theoretically the fixation seems sound, but let me say that it simply does not work out, and is no longer used. I believe the chief objection is that it definitely interferes with the blood supply of the ununited bone fragments. Secondly, we have the very popular inlay bone graft, for which we are indebted to Albee who has used it in nearly every part of the body. The electric circular saw or twin saw makes parallel cuts through the cortex along one fragment, after proper exposure of the fracture, denudation and alinement of the two fragments, then across the fracture to make parallel cuts on the other fragment. These cuts should be about four to six inches long. The bone thus marked out by the circular saw is removed after drilling at either end, leaving a trough into which is placed a single piece of bone of the same width and length from another bone. Or in cases of tibia fracture, a sliding bone graft is used, taking the graft from one fragment and sliding it across the fracture to fit into a trough in the opposite fragment, similarly made, thus holding the two fragments securely after the method of cabinet making. Fixation is made still more secure by the insertion of heavy catgut through holes drilled through the sides of each fragment, and brought over the graft to hold it down in proper relation to the cortex. The wound is closed without drainage, and a secure cast applied. Lastly, we have the onlay graft as finally perfected by the late Willis Campbell of Memphis, and Henderson of the Mayo Clinic. It is designed to permit fixation as well as to promote osteogenesis. The general plan is to lay a large graft of bone across the fracture upon the flattened cortex of the bone fragments while the endosteal portion of the graft and cancellous bone from the upper end of the tibia are also used to encourage osteogenesis. After the fracture site is well exposed, the fragments cleaned of intervening tissue, and the periosteum stripped transversely for about three-fourths inch, the cortex is pared or planed to form a flat surface extending if practical for some six inches with a width of one-half to three-fourths inch. At the same time a large full thickness cortical graft is taken from the tibia, and split longitudinally to give two grafts, one of cortical bone and one including the endosteum. A small portion of the latter is inserted into the medullary cavity to promote osteogenesis, while the strong outer plate is placed snugly on the flat surface of the fragments, and held in place preferably by six or eight autogenous bone pegs, inserted through the graft and recipient after holes have been drilled. Sometimes it is found more convenient to use vitalium screws. Small pieces of cancellous bones are placed about the fracture. A well supporting cast is applied. While the onlay graft as perfected by Campbell and Henderson is probably the last word in autogenous internal fixation, your essayist believes that in the femur, and usually in the humerus, metal fixation is better because of the greater tensile strength.

While bone grafting has been done primarily for ununited fractures of the long bones, notably the tibia, the procedure has extended to many other fractures. Such a list would include ununited fractures of the internal malleolus of the tibia, a condyle of the humerus, the femur or the tibia, thus treated after of course a preliminary careful denudation of the ununited fractured surfaces and corrected alinement. A hole is drilled through the malleolus and on into the shaft, and a properly sized graft introduced. The vitalium nail is probably just as effective. In the patella, some ingenious grafts have been used, either the simple short one across the gap, or the graft in the shape of the Roman numeral one to hold the fragments together. However, in many cases we have found it of advantage to remove some ununited fragments of the patella altogether, and some surgeons remove the entire patella without increasing the disability. Ununited fractures of the shaft of the femur are fortunately not common especially at the lower extremity, but graft is the best try. Campbell advised a graft, starting as an onlay on the shaft but inserted directly into the cancellous bone of the condyle. It is impossible to get really good internal fixation, so that occasionally fusion of the knee together with a long graft has to be offered. Above the

condyles, fractures of the shaft, and of the trochanter, when they do not unite yield best to plating or grafting.

Ununited fractures of the neck of the femur form a large chapter in fracture work. As said earlier in this paper, only one-third of the fractures of the hip unite. Much has been written on hip fractures, beginning with early authors who believed that no one ever recovered from fractured hips and that the only treatment was prevention of pneumonia. In recent days we have had pounded into us the theory of Whitman who believed that reduction by internal rotation and extreme abduction of the thigh solved the problem. This abduction treatment was believed to surpass continued traction by Buck's extension. In the last few years various internal fixation methods have been advocated with varying success, both by open reduction and by so-called blind nailing. Smith Petersen of Boston has produced, most of us believe, the most sound method of cure in these cervical fractures. He first reduces the fracture by upward traction of the flexed thigh, followed by internal rotation and abduction of the limb. Then with the extremity in a position of about 20 to 25 degrees of abduction, and 10 to 15 degrees of internal rotation, good reduction being confirmed by X-ray, he exposes the lateral aspect of the femur just below the trochanter, and drives in a graduated pin upward and inward through the neck into the head. If antero-posterior and lateral X-ray views show proper alinement of the pin, a special three-flanged nail is threaded over the graduated pin and driven in for a distance of three to four inches, varying with the length of the femoral neck. Following this surgery, no cast or brace is needed, and the patient begins weight-bearing in four months.

So much for successful results, but we do know that very frequently in spite of careful nailing or in unoperated cases, healing does not take place because of absorption of the neck or head or both, with upward displacement of the shaft, and consequent marked disability so that the patient either does not try to walk, or gets about at best with a marked limp even with crutches or a brace or both. So we have the ununited fracture of the hip with shortening and inability to bear weight unassisted and constant pain. The femoral head may be alive but the neck absorbed, or the head may itself be disappearing. Many types of hip reconstructions have therefore been conceived, some of them worth nothing and some good. The success of the reconstruction operation depends upon the securing of good weight-bearing alinements. Let me list briefly the more valuable types of operations. First the autogenous bone peg operation of Albee where either the fibula or a bone graft from the tibia is driven upward and inward from below the trochanter through the neck and into the head. This is indicated where the head is alive and the absorption of the neck is slight. Secondly open reduction and internal fixation may be done when more absorption and overriding are occurring. Here the fragments must be denuded and the fracture again reduced and internal fixation done as in fresh fractures. Thirdly we have the large group of so-called head is not visable, or where there is marked reconstruction operations, indicated where the absorption of the neck and excessive upward displacement of the trochanter. The operations are resigned, not to establish normal function, but to give the patient a more or less stabile weight-bearing extremity either by attempt at insertion of the proximal end of the distal fragment into the acetabulum or beneath the head of the femur. The Brackett operation demands the placing of the freshened surface of the trochanter into the excavated head. Stability is then secured by severing the muscular attachments to the trochanter together with the perioseum and thin layer of bone, and reattaching them lower on the shaft of the femur. If however the femoral head is not viable, the Colonna operation may be used. removing the head, inserting the trochanter into the acetabulum and suturing the muscular attachments to the trochanter down to a lower level on the shaft of the femur. The Whitman reconstruction operation is similar to the Colonna operation. The head of the femur removed, and the base of the trochanter divided and brought down to be attached to the lateral aspect of the femoral shaft. In the Albee operation the head is removed, but instead of being discarded is partially resected and driven into a cleft or gap created by splitting the trochanter longitudinally and prying laterally the partially fractured section of the trochanter, thus making more stabile and secure the approximation of

the stump of bone to the acetabulum by the increased tension of the abductor muscles. These operations produce a better weight-bearing alinement. Fourthly and lastly we have the osteotomies below the tronchanter for the purpose of displacing mesially the shaft of the femur so as to be directly under the acetabulum. These osteotomies are designed to eliminate the shearing action at the site of fracture and to make a new line of weight-bearing, whether union takes place or not. This last type of operation may be indicated in those individuals who cannot stand the reconstruction operations listed above.

COMMENT

I have tried to give in a sketchy way the various means for combatting the disabilities resulting from unfortunate cases of nonunion. By no means can we expect success in all cases, but at least in a good majority of cases we can lessen the functional disability even though anatomic restoration is not brought about. As stated at the beginning, functional betterment is more to be desired than anatomic correction. In the lower extermities, satisfactory weight-bearing is more important than accurate bone contour.

Skin Diseases Under War Conditions

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SKIN disease has always figured prominently in war-time. It has added greatly to the discomfort of the soldier in the field, and its commonest manifestations have been parasitism, and the skin complications of malnutrition.

All populations have a certain incidence of skin disease and statistics reveal that some ten diseases—which may differ somewhat as to locality—constitute about 70% of dermatology. As the skin is a surface organ, and therefore, more than any other, influenced by environment, it is not surprising that the altered living conditions and occupations of war-time profoundly influence the incidence of certain of its diseases.

War is a very serious business, in which every detail counts towards the final triumph of victory. Essential above all things is the maintenance of man power; every soldier unfit for the firing line is a gain for the enemy, and for military purposes; it does not matter what removed him from the line, only that he has been removed.

In war the losses occasioned by diseases of the skin may be considerable, and therefore we should be much concerned with two questions; first, whether we can prevent them and second, when they have occurred, how we can best cure them.

In dealing with diseases of the skin, not only are we alleviating illness, but, further, since nearly every case will return to duty, we are able to add considerable reinforcements to the combatant forces. We are dealing with men whose general health is but little impaired, many of whom are highly trained soldiers, and who, from a purely military standpoint, are of the utmost value to the combatant force. I particularly wish to emphasize this point, because it is so necessary to insist that the employment of the highest skill and best methods are well repaid by the results obtained.

The work of the dermatologist is important for a further reason. Where so large a proportion is afflicted with a disease of a contagious or infectious nature, the early diagnosis of one case may mean the prevention of many others.

The problem is not a new one. In medical history of past wars we learn how severe and extensive skin complaints were. During the Napoleonic campaigns cases of itch were counted by the hundred thousand. During the war between the States, out of an army of 600,000, 35,000 were diagnosed as scabies and another 36,000 were merely recorded as skin disease. So severe was the former complaint, that its pathology was much disputed at that time.

In the United States Army from April 1st to December 31st, 1919 there were 126,365 cases classified primarily as Skin Diseases. In addition, over 18,000 cases of skin disease, concurrent with other diseases were admitted to hospitals. This makes a total of over 144,000 patients with skin diseases. It is important to

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note that pediculosis is not included in this series, since soldiers with pediculosis were rarely sent to hospitals. It was estimated that pediculi infested about 90% of a combat division.

SCABIES

Of all the skin diseases referred for treatment the commonest was scabies. Knowles claimed that scabies in itself had the reputation of destroying 50% of a soldier's efficiency.

Therefore, we have sufficient precedent to cause us to seriously study the problem. In the past, typhus and typhoid played frightful havoc in field and camp; these diseases medical science has curbed—the scourge of scabies still remains. With such evidence from the past before us, I think it is apparent that the scope of dermatology is considerable, not in our army alone, but in those of our allies also.

The question arises, where can scabies be most efficiently dealt with? The regimental commanding officer is naturally loathe to lose a soldier, from, what to him, appears to be a trivial complaint. What plan can be followed?

I maintain that the method which is most suitable for the majority, the most easily carried out with the facilities at hand, and the least expensive, is best. Any system to be effective must fulfil the following conditions.

Burrows must be opened to permit the parasiticide to come in contact with the insect and the ova. The parasiticide should be of such a nature as to destroy the parasite without producing dermatitis; finally to prevent re-infection, contact clothing and bedding must be disinfected.

The first of these conditions is achieved by a hot bath, soap and vigorous scrubbing. The second, by the application of sulphur ointment for *three successive days*. The third, by means of any steam pressure or sulphur vapor apparatus. To be effective by this or any other system it must be thoroughly and conscientiously carried out. Many other remedies have been used, such as Balsam Peru, Beta Napthol, Pyrethreum, etc. None are universally satisfactory; some are too costly; others produce dermatitis, but for general use I do not think any plan superior to the one outlined. Frequently the lesions of scabies still persist at the end of treatment, and although the acari are entirely destroyed, the remedies employed may set up a dermatitis which itches as badly as the original disease. Experts are aware of this fact, but it is frequently overlooked by others. If these facts were remembered the practice of continuing the application of sulphur ointment for days or even weeks, under the mistaken idea of obtaining a more thorough cure, would cease.

Sulphur ointment is the time honored remedy for scabies. Other remedies useful either for their elegance, or, in cases which have exhibited intolerance to sulphur are available.

The cry has been for a one-day treatment, i.e. a one-day drug, for scabies. The facts are that cases of scabies of recent origin in the cleanly, and in the absence of septic complications, require less parasiticide than long standing cases. The infection is less profuse, and the acarus is less deeply buried in the skin. This is the type of case usually seen in private practice, where housing is satisfactory and bathing facilities appreciated.

Quick treatments are more or less successful in a population which is only slightly infected, because it is in the habit of taking regular baths, but put the same infected population in circumstances which prevent regular bathing and changes of underwear and sheets, and a different type of scabies will result. Quick treatment there would have many failures. Up to the present, there seems to be no drug which will cure all cases of scabies in twenty-four hours.

Reference should be made to the pyodermic complications which sometimes ensue. Its distribution on the lower half of the buttocks, penis, and scrotum, and frequently over the knees and elbows are very characteristic. This impetigo is of an ecthymatous type and is caused by a streptococcal infection. It is relatively common in cases of long standing.

Those unfamiliar with it are apt to overlook the primary scabies, which may be of rather slight degree. The presence of the pyoderma in no way contradicts sulphur applications, which indeed often acts very beneficially. After the scabies has been cured, the same treatment is followed as for ecthyma elsewhere.

PEDICULOSIS

The pediculus, in order to cause wide-spread human infection, requires a low standard of cleanliness amongst the population, particularly as regards bathing and change of clothing. The parasites, owing to their great mobility,

can quickly attack large numbers of individuals provided circumstances are suitable, and this spread is much more rapid than in the case of scabies. In scabies, the acari have a limited range of movement, and intimate contact with an already infected individual or an inanimate object is necessary for its transference, as compared with the louse which can move from person to person of its own free will. Conversely, however, the acarus takes a much firmer hold of the skin—living in it and on it, whereas the louse lives on it and in its neighborhood. Apart from the itching, the louse is responsible for epidermics of abscesses and impetigo on covered areas, and in this way can produce widespread incapacity.

The problem of diagnosis in the field is sometimes complicated by the presence of lesions and itching caused by pediculi. The lesions on the buttocks, caused by scabies are found on the lower portion of the buttocks, while those of pediculi are almost always confined to the upper portion. In fact where these lesions become impetiginized, they are almost pathognomonic of scabies. So far as I have observed, pediculi never attack the penis, while this organ is frequently effected in scabies; and the presence of papules or crusts there is of great help in arriving at a diagnosis.

Pediculosis Capitis is probably more difficult to control in persistantly infected areas than are either scabies or pediculosis corporis. The complicating impetigo and septic dermatitis may require weeks or even months of treatment. Shaving the head is the ideal procedure, and is absolutely necessary in the presence of septic complications, where any objections to it should be firmly over-ruled.

Skin disease during war is not made up entirely of scabies and its complications. We frequently see an ecthyma, which is a dermic impetigo, of severe type and long duration. The legs, thighs and buttocks are most commonly involved, and occasionally in neglected or maltreated cases, become quite wide-spread. The primary lesion is an ulcer, often astonishingly deep, covered over by a thick blackish crust; by pressing down on this crust, pus can be squeezed out along the border. A surrounding red halo marks the active extension of the process, indeed when the crust has been removed a platinum loop can usually be passed under the skin for some distance, and this undermining makes treatment difficult. In many cases following the healing, marked pigmentation tnd scarring remain. Not infrequently it may be followed by papillomatous or warty growths having somewhat the resemblance of a verrucose tuberculosis. The organism is a streptococcus, and, as might be expected, of the fecalis type. Since it so frequently originates on the legs and is associated with streptococcus fecalis and staphlycoccus albus, it is reasonable to assume that it may begin by some slight abrasion or scratch becoming infected with soil or water which has been contaminated with excrement.

I recall a case where a Marine cured of some other ailment had been discharged from the hospital, and wishing to return, tried to copy the lesions of ecthyma by applying phenol, and when accused of a self-inflicted lesion, confessed his deception, and is now, I am sure, distinguishing himself in some more worthy manner!

Ecthyma may be confused with the flat pustular syphiloderm. In syphilis the lesions are usually more numerous and of wider distribution, the edges of the subjacent ulcerations are abrupt and sharply defined, there is little or no discomfort and the crusts are bulky and more greenish in color. Other signs of syphilis are usually present. The prognosis is to a certain extent dependent upon the patient's general condition. Until the advent of the sulfonamides, treatment was difficult, healing slow and tedious, and new lesions would appear in the most disappointing manner. In the majority of instances tonics are indicated. Numerous remedies have been advocated. The crusts should be removed by means of starch poultices or similar wet dressings, the loosened edges trimmed off. The lesions should be cleansed and a mild antiseptic such as ammoniated mercury applied. If the ulcers prove sluggish they should be painted with a 3% silver nitrate. The sulfonamides by mouth, and locally should not be overlooked. An excellent preparation for local use is one dram of sulfanilimide powder in one ounce of warm glycerine. May I add that in my hands, neither the stock nor autogenous vaccine have been of much benefit.

SEBORRHOEA

Another important disease is seborrhoea, the diagnosis of which is not always easy. When well-marked the characteristic distribution—scalp, brows, bearded region presents a picture easily recognized. The midsternal and inter-

scapular regions are frequently involved, and the so-called eczema of the flexures is more often really a seborrhoea.

The disease tends to pass through three phases, any or all of which may be represented. First, a dry erythemato-squamous condition. Secondly, eczematization characterized by the presence of weeping surfaces usually limited to the scalp and ears. Thirdly, a condition of impetiginization, from contamination with streptococci. The last stage may cause some considerable confusion, the purulent areas or "stuck on" crust bearing a striking resemblance to impetigo contagiosa. Most remarkable is the susceptibility of the affected individual to secondary bacterial infections. Streptococci and staphlycocci are invariably present. Sometimes a streptococcus plays a more serious role, producing a severe adenitis of the neighboring glands. The resemblance of localized patches of this impetiginized seborrhoea to impetigo contagiosa is close and often confusing. This is particularly true when the ears alone are affected, for in such cases a secondary involvement of the meatus is set-up with a purulent discharge. A careful history will be quite helpful in making a correct diagnosis. Remember that in seborrhoea the ear discharge *follows* the skin affection and does not precede it, as it does in impetigo associated with an otitis media. The impetiginization may also be localized on the chin or in the eyebrows.

TREATMENT

It is essential that the remedies employed in seborrhoea, especially the impetiginized form, should come in close contact with the affected skin surface. For this reason when the disease attacks the scalp, this region should be shaved as a preliminary measure. The same rule applies to the bearded area. Altho secondary coccal affection is so frequently present as a complication, treatment should be directed against the eczematoid condition. It has been found that even mild antiseptics almost invariably aggravate the condition.

In the early stages calamine liniment acts very nicely. The formula that I usually employ, one recommended by McCormack of London, is as follows:

Calamine	gr. XX
Zinc Oxide	gr. XV
Lime Water	Z TT
Olive Oil	Z T

The mode of application is important. After the preliminary shaving, cotton or gauze soaked in the remedy is applied directly to the involved area; not only does this allay the discomfort, but as it is of an oily nature, crusts are at the same time softened and removed.

The ears require particular attention. After gently syringing the meatus with warm boric solution, pledgets of cotton soaked in the liniment are packed into all folds and moulded behind the ears so as to keep the skin surfaces separated. Over this apply a layer of cotton and then bandage lightly, thus "splinting" and preventing movement. Later, more stimulating remedies may be tried cautiously. On the body, weak sulphur ointment generally proves quite satisfactory. The striking resemblance of this condition to impetigo frequently tempts Medical Officers to use mercurial ointments with invariable failure. The rapidity with which calamine liniment affects improvmeent in these cases is quite gratifying. General tonic treatment is also indicated in many of these cases, especially if anaemia is present.

EPIDERMOPHYTOSIS

(Athletes Foot)

Owing to troop movements, tropical skin lesions may find their way to this country in considerable number.

In the past twenty-five years, another skin disease has assumed military significance; viz. Epidermophytosis. This condition has spread rapidly. The interdigital areas and soles of the feet are perhaps the commonest sites to become affected. The groins and adjacent thights are the next frequently attacked areas. Re-infection in individual cases occurs from clothing, and case to case spread occurs through the meduim of fungus contaminated floors and lavatory seats. A very fruitful source of contamination are shower bath floors and about indoor swimming pools. Heat and moisture are exceedingly favorable factors for its propagation, while it is inhibited by cold and dryness. The fungus is difficult to destroy and may remain in an avirulent state for long periods.

GAS

There is no doubt about the certainty of the occurance of necrotic skin lesions in the event of vesicant gas being used as an instrument of war. Following cutaneous contact with such gases there is a latent period of some time before the inflammatory reaction sets in. Low con-

centrations cause a simple persistant erythema followed by pigmentation which causes no incapacity. More concentrated gas causes intense reactions which are essentially exudative in character. A subedermal bulla commences to develop and is complete in about twelve hours from the start of the reaction. Removal of the roof of this bulla reveals an ulcer, the pallid base of which is formed by the dermis, and requires from four to twelve weeks to heal, depending upon its size.

Prior to the complete development of the bulla, a one percent solution of gentian violet should be painted on and around the affected area. As soon as the bulla formation is complete, the roof should be removed and wet dressings of Eusol (Aqueous Sol. of Hypochlorous Acid NF, used in the same manner as Sodium Hypochlorite) applied to the base of the ulcer for a few days, the surrounding skin being covered with a paste consisting of Ichthyol one percent, Zinc Oxide 15%, and Soft paraffine 84%. Thereafter the paste should be applied twice daily to the ulcerated area, but if the base of the ulcer again develops a purulent exudate the Eusol soaks should be resumed for a few days. This is a simple effective treatment according to Dr. G. H. Percival of Scotland.

CONCLUSION

Skin diseases are very common, and very important as regards the efficiency of armed forces. With well trained personnel most of these diseases can be prevented.

Military dermatology in all its phases can be best administered by the dermatologist who has had military training and experience. A distinct place should be made for him in the military organization.

On the other hand the dermatologist himself must realize that the *first* consideration is for the military situation, and second for his status as a medical specialist.

AMERICA AT WAR

The Critical Antimalarial Problem

It is axiomatis that troops cannot operate successfully in endemic malarial areas without an effectve antimalarial drug. Malaria is present throughout most of the tropical and subtropical world. The extent of operations in these regions is steadily increasing and it is conceivable that they may grow to tremendous proportions within a short period of time.

Ninety per cent of the world's customary sources of quinine was cut off when the Japanese invaded Java and the Philippines. India has in the past frequently imported cinchona bark from Java to bolster her supply. South America has for many years been importing bark from Java for domestic use.

What measures should be taken to safeguarl our limited stocks? Early in May the War Production Board recognized the critical nature of the problem. In order to avail itself of medical advice it asked the National Research Council to form a Committee on Drugs and Medical Supplies to investigate and advise not only on the many problems which the quinine scarcity presented, but also on any other matters pertaining to Drugs and Medical Supplies which concerned the War Production Board. This committee has two subcommittees, one on Essential Drugs, the other on Hospital and Surgical Supplies. The Committee has also used the advice of other National Research Council Committees, such as the Subcommittee on Tropical Diseases for answers to specific problems in the therapy of malaria, and the Committee on Surgery for technical problems related to surgical supplies.

The program worked out by the joint efforts of the War Production Board and the National Research Council progressed as follows:

1. The War Production Board issued "Quinine Order M-131" which froze present stocks and restricted the use of quinine and other cinchona alkaloids to the treatment of malaria, except that quinidine could also be used for the treatment of cardiac disorders. Requests for quinine for the treatment of various other conditions including quinine urethane and quinine urea as local anesthetics, quinine in sodium morrhuate for varicose vein injections, quinine salts for induction of labor, quinine salts in the treatment of night cramps, multiple sclerosis, amyotrophic lateral sclerosis, myotonia atrophica, paralysis agitans and myotonia congenita, have all been carefully considered and denied with the exception of the use of quinine in the treatment of myotonia congenita.

2. Repeated persuasive efforts in the trade press have been instituted by the War Production Board to bring in all unopened packages of quinine, and now the machinery is being set up for bringing in opened packages, analyzing each and pooling according to the type of preparation.

3. To effect the maximum antimalarial value of available cinchona bark from South America, the National Research Council undertook to investigate the feasibility of substituting totaquine for quinine in the treatment of malaria. Totaquine had been recognized previously by the U. S. Pharmacopoeia, and a standard set which appears in the 12th Edition. This standard seemed to allow for too much latitude both in quinine content and in total crystallizable alkaloid content. Accordingly, the National Research Council asked the U. S. Pharmacopoeia to revise the monograph to obtain a more uniform standard. As the result the U. S. Pharmacopoeia adopted the following monograph which will appear in a supplement of the 12th Edition.

"Totaquine is a mixture of alkaloids of from the bark of Cinchona Succirubra pavon and other suitable species of Cinchona. It contains not less than 7 per cent and not more than 12 per cent of anhydrous quinine, and a total of not less than 70 per cent and not more than 80 per cent of the anhydrous crystallizable cinchona alkaloids, the designation "crystallizable alkaloids" referring to cinchonidine, cinchonine, quinidine, and quinine.

Totaquine of a higher quinine percentage may be reduced to the official quinine standard by a mixture with Totaquine of a lower percentage, or with any of the diluents permitted for powdered extracts under Extracta, page 174, providing the total anhydrous crystallizable cinchona alkaloids do not fall below the required percentage.

The National Research Council recommended the dose to be 10 grains three times a day for 7 days."

It was the considered opinion of the Subcommittee on Tropical Diseases, and the Committee on Medicine of the National Research Council, that in this dosage totaquine should prove to be as effective as quinine sulfate in the oral treatment of malaria. A satisfactory price structure has been set up for cinchona bark from South America by the Board of Economic Warfare, and every effort is being made to stimulate importation.

4. The production of atabrine has been stimulated by the War Production Board, and the present outlook on production sufficient to supply all anticipated needs is practically assured. Extensive chemical pharmacological and clinical investigations have been conducted by various groups of the National Research Council working under grants by the Office of Scientific Research and Development. The chemical studies have adequately demonstrated the chemical purity of the atabrine produced in this country. Pharmacological and clinical investigations have revealed temporary gastrointestinal disturbances in a variable percentage of persons receiving atabrine in the suppressive (prophylactic) treatment of malaria. Further studies is under way to elucidate the cause and remove if possible these disturbances. There is a tendency to the development of a yellow pigmentation of the skin during administration which disappears after the drug is stopped. This is harmless and not associated with any disturbance in liver function.

5. Experience with the use of atabrine by the British both therapeutically and as a suppressive, indicates that it is an effective antimalarial and in some ways superior to quinine. It is slower in action, and therefore not as useful in the initial treatment of malaria, but after one to three days of quinine therapy atabrine is exceedingly effective. At a recent meeting of the Subcommittee on Tropical Diseases of the National Research Council, the following program of dosage was endorsed as an efficient routine of therapy:

(1) *Combined QAP Treatment.* (Method of choice.)

(a) *Totaquine or Quinine sulphate,* 0.64 gram (10 grains) three times daily after meals for 2 or 3 days, or until pyrexia is controlled. !Then give

(b) *Atabrine,* 0.1 gram (1½ grains) three times daily after meals for 5 days. Then after 2 days without antimalarial medication give

(c) *Plasmochin,* 0.01 gram (3/20 grain) three times daily after

meals for 5 days, except for the debilitated patient, who should receive only two doses daily. (Discontinue if toxic symptoms occur. Never give atabrine and plasmochin concurrently.)

(2) *Atabrine-plasmochin treatment.* (May be used for simple vivax infections and in other infections when no totaquine or quinine is available.)

(a) *Atabrine*, as above for 7 days. Then, after 2 days without antimalarial medication, give plasmochin, 0.01 gram three times daily for 5 days, as above.

(3) *Totaquine* or *Quinine-plasmochin treatment.* (Method when no atabrine is available.)

(3) *Totaquine* or *Quinine sulphate*, as above, for 7 days, during the last 5 of which accompany each dose of totaquine or quinine with plasmochin, 0.01 gram three times daily.

BRITISH EXPERIENCE IN CIVIL DEFENSE

Three years of British experience with air raids have significantly modified earlier concepts regarding the field casualty service.

1. Heavy raids occur invariably at night; heavier high-explosive bombs and land mines are now being employed, up to 2,000 kg., with much greater destructive effects. Incendiary bombs are used in much larger numbers, and fire is now the most serious hazard. Daylight raids are usually hit-and-run affairs in which solitary planes participate.

2. In large cities the field casualty service may handle 2,500 to 3,500 casualties during a night raid. All serious casualty are moved directly to hospitals, never to first-aid posts. Heavy raids are apt to be repeated on subsequent nights when the protective forces are exhausted.

3. A large fleet of four-stretcher ambulances is essential for life saving. Fourteen thousand ambulances were made in England and Scotland by purchasing used cars, stripping them, and then mounting a simple ambulance body on the chassis. London uses over 1,500 of such ambulances and 550 sitting-case cars. The use of tradesmen's trucks proved universally unsatisfactory; 3 out of 4 never arrived on the scene, and lives were lost due to the delay and confusion. Because of the large number of casualties to be transported in a few hours, no ambulances which carry less than 4 stretchers are employed. For the simultaneous evacuation of damaged hospitals, a fleet of 200 converted busses carrying 10 stretcher cases and 6 to 10 sitting cases are immediately available, and another 200 are obtainable within 2 hours.

4. Casualty stations (British fixed first-aid posts) are necessary at or near all hospitals and at places more than a mile from hospitals to care for minor casualties which do not require hospitalization. Many are now on a care-and-maintenance basis and are activated only during a raid. When functioning, the staff usually consists of one or two doctors, several nurses, and a variable number of aides and auxiliaries.

5. In large cities casualty stations need not be more numerous than 1 per 25,000 inhabitants; they should be located about a mile apart. There are less than 300 in the London area, with a population of about 10,000,000 and a land area more than twice that of Greater New York. In smaller, thinly settled communities, they are more numerous in relation to population, but the distances between them are proportionately greater than in metropolitan cities. Many of the minor casualties are moved to first-aid posts in sitting-case cars; some walk.

6. First-aid parties (our stretcher teams) are not necessary, are a waste of manpower, and are rapidly being eliminated. First aid at incidents is essentially a function of the rescue parties (our rescue teams), which extricate the casualties from under the debris of demolished buildings. All first-aid parties in England and Scotland are, therefore, being merged into the rescue parties. They include a leader, and eight other members, and are entirely independent of the fire department. They are a life-saving service related to the medical services concerned in field casualty work.

7. The experiences of Britain under air-raid conditions have dispelled many preconceived notions concerning first aid. Almost all raids occur at night; the victims are crushed under the debris of demolished buildings and are either dead or severely injured; less than a third are slightly injured and can be cared for at

casualty stations; all the severely injured must go to a hospital; victims are invariably covered with dust and dirt which hangs in the air for hours. The conditions under which the rescue workers encounter the injured beneath the structural debris, the darkness and the dust which always fills the air, the large proportion of dead and severely injured, and the urgent need for immediately hospitalization make it impossible to apply most peacetime concepts of first aid.

8. Wounds are usually grossly contaminated and need only be covered with a shell dressing until the casualty reaches the hospital. Hemorrhage is usually controllable with a pressure dressing. The tourniquet is rarely employed. Burns are covered only with sterile gauze until the casualty arrives at the hospital. Tannic-acid jelly as a first-aid dressing for burns has been discarded because of the dirt which invariably contaminates the burned surface, because the jelly deteriorates rapidly, and, lastly, because tannic acid ignites in the presence of phosphorus when applied to burns caused by the explosion of phosphorus-oil bombs.

9. Traction splints are not used. An exception is made if the casualty must be transported a long distance over country roads. Unlike Army field experience in the last war, the few miles of travel to a hospital over the paved roads of a city do not warrant the application of traction, especially as the darkness and the conditions of an air raid also make hurried application of the procedure difficult or impossible. All that can be done is to place the fractured extremity gently in alignment, bind it with triangular bandages to the uninjured leg or to an improvised splint, or apply a Thomas splint if one is on hand. Movement of the fragments can also be minimized by snug application of the blankets according to the Wanstead technic of blanketing and by the use of sand bags, which should always be carried in the ambulance.

10 Shock is treated at the incident by prompt administration of adequate doses of morphine (up to ½ grain for adults), coramine, proper blanketing, administration of fluids, and the use of hot water bottles during the transportation to the hospital. The use of plasma or blood transfusion is deferred until arrival at the hospital; it is ordinarily quite impossible in the darkness, dirt, and confusion at the incident.

11. The presence of a physician at the incident is invaluable, but more than one is unnecessary. In fact, one physician may cover several nearby incidents, leaving his nurse or one of the nursing auxiliaries of his emergency team at the incident while he moves temporarily from one to another in the immediate neighborhood.

12. Even though a single night's casualties requiring hospitalization may total one or two thousands, large hospitals rarely receive more than 50 to 100, the load being distributed as evenly as possible throughout the city.

13. A large casualty receiving hospital is often related to one or more peripheral hospitals in the suburbs or in a country district. There are now four base hospital beds for each casualty bed in the cities.

14. Upon receipt at a local report and control center of a message from an air-raid warden that an incident and casualties have occurred, an "express party" is immediately dispatched to the scene. An "express party" includes one rescue-first aid party, one ambulance, one sitting-case car, and one mobile medical unit (our mobile medical team). The latter consists of one physician, one nurse, and two auxiliaries. No other equipment and personnel of the emergency medical service is dispatched unless additional assistance is requested by the incident officer (usually a higher police official or by the incident physician on the scene. In this manner useless movement is avoided and equipment and personnel of the community is carefully conserved.

—Circ. Med. S. 20

TRAUMATIC SHOCK

Although the first recorded recognition of the clinical condition known as shock occurred almost two centuries ago, only a few serious attempts to apply existing physiological knowledge to elucidation of the mechanism of its production were made prior to the World War of 1914-18. During these years interest in the problem in Great Britain and the United States showed a sharp upward curve. Both in the laboratory and on the battlefield surgeons and physiologists cooperated to utilize their unprecedented opportunities for the study of

shock in man. In view of the almost invariable co-existence of shock with war wounds of any severity the salient features of these and subsequent reports and their application to treatment, are presented in the following paragraphs.

The mechanism of production of traumatic shock is a controversial issue. In a brief discussion it is impossible to analyze the various theories which have been advanced to explain the manifestations of the serious condition, but nevertheless the fundamental pathological findings and the main methods of treatment may be noted.

PATHOLOGICAL FEATURES

Essentially traumatic shock consists of failure of the circulation. There is more or less general agreement that the quantity of actively circulating blood is much diminished, and that is due, partially at least, to stagnation of blood in the dilated capillaries of deep-seated structures, particularly the skeletal muscles. In many cases this condition is, of course, aggravated by loss of blood and plasma at the site of the injury and loss of plasma into the body tissues as a consequence of increased capillary permeability. Associated with a diminution in the available volume of blood there may be an increased blood viscosity and hemconcentration with high hematocrit values if acute plasma loss has also taken place. Hemoconcentration is not, however, regularly found in shock. Profuse vomiting and sweating may also be contributory factors in the production of hemoconcentration. In addition, diminished venous return to the heart results in a reduced cardiac output. Frequently there is a fall in blood pressure and retardation of blood velocity. The roles played by the absorption of toxin and the reception of nerve impulses from the traumatized area are not as yet fully understood.

CLINICAL FEATURES

Generally the severity of the shock parallels fairly closely the gravity of the wound, but a pre-existing debilitated condition due to cold, hunger, or fatigue may predispose to a degree of shock out of all proportion to the severity of the injury. Psychic factors such as intense fear or excitment may also produce the same result. Wounds involving the abdominal viscera are particularly prone to cause severe shock, as also wounds in which conditions favor absorption from damaged tissues. Thus, the condition is likely to develop rapidly in individuals who have sustained wounds characterized by great internal disruption but in which there is only a small opening communicating with the surface. Since shock becomes manifest in almost every case of severe injury its onset may justifiably be anticipated in all cases in which trauma is extensive or severe, and even more particularly if there is evidence of excessive blood loss or a history of prolonged exposure to cold or wet.

The clinical characteristics of shock are variable but in the majority of cases they include at least some of the following signs and symptoms:

1. Falling blood pressure. In the absence of head injury a falling blood pressure is one of the most constant features of developing shock.

2. Rising pulse rate. An increase in pulse pulse rate is quite frequently observed in shock. In severe cases it may rise to 160 or more per minute, becoming at the same time weak and thready. On the other hand shock may co-exist with a pulse rate of 80 or less.

3. Abnormal appearance. Frequently the extremities and the skin surface in general are cold and pallid. In some cases, however, there is cyanosis or lividity with delayed filling of blood vessels. The latter is easily demonstrable by watching for return of color after-blanching the skin over the forehead by pressure.

A. Symptoms. The patient generally manifests an expression of acute anxiety and shows signs of restlessness and apprehension. Frequently he complains of excessive thirst. On occasion the patient's mental processes may be quite rational and his attitude one of complete calm.

TREATMENT

It is of paramount importance that the treatment of shock be commenced at the earilest possible moment so as to limit its severity to the minimum which circumstances will permit. In wartime the facilities at the disposal of the pracitioner naturally vary with the immediate circumstances. At the scene of a calamity it may be impossible to do more than arrest hemorrhage and give relief from pain by an injection of morphine. At a casualty clearing station facilities may be somewhat more ample but it is the general consensus that adequate treament of severe shock can be carried out only in the

fully equipped resuscitation ware of a hospital. Taking into consideration the time factor it is obviously of great importance that, following the first immediate aid which can be given to the patient, he should be dispatched without delay to the nearest hospital equipped to deal with such emergencies. It is important, too, that his removal be carried out with a minimum of disturbance, for rough transportation, continuous noise, and the like may seriously aggravate his condition.

It should be understood, of course, that in conjunction with treatment for shock such measures as are immediately necessary for the treatment of the wound should also be undertaken.

As most patients suffering from traumatic shock are also experiencing either pain or anxiety the administration of morphine is frequently called for. However, the drug should be administered with caution in doses not exceeding one-half of a grain. If necessary the dose may be repeated at suitable intervals. It is a wise precaution in the event that the patient is to be removed elsewhere for further treatment to signify the time and dosage of morphine administration on a card which accompanies the patient on his removal. In cases of head injury it is considered wiser by many to substitute one of the barbiturates, such as sodium phenobarbital for morphine. It should be noted that doubt has recently been expressed as to the advisability of applying external heat to the severely shocked patient on the basis that the resultant cutaneous vasodilatation causes a preipheral pooling of blood, decreasing benous return, and thus contributing to circulatory collapse. If the patient is able to take them, hot drinks may be administrated provided no abdominal injury is present and immediate operation is not contemplated. Oral administration of fluid should be discontinued, however, if vomiting, with its attendant danger from aspiration, take place. Oxygen inhalation has been employed with beneficial effect by some clinicians.

There is no doubt that the most beneficial single measure to be employed is the restoration of the available blood volume, and this can be done only by the administration of fluids. The most commonly used fluids for this purpose are whole blood, blood plasma, and saline. Their respective merits may be described as follows:

Whole Blood: Transfusion of whole blood is obviously indicated in cases in which there has been considerable blood loss by hemorrhage. However, in cases in which there has been little or no hemorrhage plasma transfusion is, in the vast majority of cases, preferable to transfusion of whole blood. The results of hematocrit and hemoglobin determinations should prove helpful in arriving at a decision in cases in which there is doubt as to which fluid is preferable.

Plasma: It is generally conceded that in the majority of cases plasma transfusion is the ideal method of treatment for it restores the fluid volume of the blood without increasing the hemoconcentration and at the same time make plasma protein available to the tissues. It possesses added advantages in that it may be stored for months in either a liquid or dried condition.

Saline Solution: Owing to the rapidity with which saline solution leaves the cardiovascular system to pass into the tissues or be excreted by the kidney it is now seldom employed. However, many clinicians believe that, employed with discreation, intravenous infusion of saline may on occasion prove a life-saving measure. Solutions of glucose in isotonic saline are favored by some clinicians.

There is, of course, a danger that the indiscriminate use of saline will result in tissue edema. In order to obiate such an eventuality Coller and his associates have devised the following rule to determine the amount of chloride required by a depleted patient: For each 100 mg. per 100 cc. that the plasma chlorides need to be raised to reach the normal (560mg NaCl per 100cc.) the patient should be given 0.5 Gm. of sodium chloride per Kg. of body weight.

The initial dose of whole blood should be 500 to 1000 cc. If plasma is employed 1000 cc. may be given as the initial dose. It is essential that a blood pressure below 80 be restored to more normal levels by means of intravenous fluid at the earliest possible moment.

Merk Manual Treatment of War Injuries, 2nd Rev.

Invest In America!

BUY WAR SAVINGS
BONDS AND STAMPS

SOCIETY ACTIVITIES

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Southwestern Medical Association

L. B. COHENOUR, M. D.
Secretary
New Mexico Medical Society

CHAS. F. RENNICK, M. D.
Secretary
El Paso County (Texas) Medical Society

COMMUNICATIONS

Sir:

Looking over your honor roll in November issue of Southwest Medicine, we notice you have not included the name of H. D. Pate, M. D., of Carlsbad, who entered service with the U. S. Navy, April, 1941.

Yours very truly,

L. H. Pate, M. D.

* * *

Sir:

The principal objects of the American Urological Association are "to encourage the study, improve the practice, elevate the standard and advance the cause of Urology." The simplest way to impress upon neophytes the value of true scientific work is by means of a material award. We would like to have each year an outstanding medical paper that will warrant a $500 check, but if such is not forthcoming several smaller prizes can be awarded. However, we are not interested in a stereotype thesis that has been prepared for an advanced degree, unless it represents original work of potential value. The competition is open to all properly trained young urologists, so for that reason we would like to have widely publicized this opportunity for a young man to obtain some money at a period when it is badly needed.

Please publish in your journal the following notice:

"Urology Award--The American Urological Association offers an annual award 'not to exceed $500' for an essay (or essays) on the result of some specific clinical or laboratory research in Urology. The amount of the prize is based on the merits of the work presented, and if the Committee on Scientific Research deem none of the offering worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years.

"The selected essay (or essays) will appear on the program of the forthcoming meeting of the American Urological Association, May 31-June 3, 1943, Hotel Jefferson, St. Louis, Missouri.

"Essays must be in the hands of the Secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis, Tennessee, on or before March 1, 1943."

Yours very truly,

Miley B. Wesson, M. D.
Chairman, Committee on
Scientific Research

* * *

Sir:

The members of the American Urological Association have recognized that, prior to the present world crisis, the great educational movement of Latin-American students for both undergraduate and postgraduate training in Medicine has been toward the European medical centers. It is our belief that we in this country have not weighed the importance of obviating the linguistic difficulties which exist among the Latin American and English-speaking countries of the Western Hemisphere and which have constituted one obstacle to mutual understanding.

The American Urological Association at its annual executive session in New York City, June 3, 1942, therefore adopted the following resolutions:

WHEREAS, The close association of the physicians of the Western Hemisphere for the purpose of facilitating the interchange of scientific knowledge would afford one basis for mutual understanding and good will; and

WHEREAS, The American Urological Association desires to contribute to the establishment of such a relationship; and

WHEREAS, the members of the American Urological Association believe that one of the obstacles in the way of mutual understanding is the difference in languages;

THEREFORE, Be It Resolved, That the American Urological Association in executive session, June 3, 1942, recommends:

(a) That all of the educational institutions of the United States which prepare students for he study of Medicine teach a minimum of two years of Spanish and/or Portugese;

(b) That the medical schools of the United States require for entrance a minimum of two years of Spanish and/or Portugese;

(c) That a minimum of two hours a week during the scholastic year of conversational Spanish and/or Portugese be required as a part of the entire term of the medical curriculum;

(d) That attempts be made to encourage physicians who speak Spanish and/or Portugese to conduct courses of lectures in these languages for students of Medicine;

(e) That an attempt be made by the medical schools of the United States, both undergraduate and postgraduate, to stimulate and foster by every means possible, including the student exchange program, the training in the schools of the United States and of Canada of Latin American students;

(f) That the officers and members of the American Urological Association cooperate with the faculties of educational institutions in the United States in any manner considered practicable in carrying out a program which will aid the English-speaking members of the medical profession to obtain a working knowledge of Spanish and/or Portugese; and further,

Be It Resolved, that a copy of these resolutions be sent to the American Medical Association and to the journal of each state society, requesting that sufficient publicity be given these resolutions to acquaint every pre-medical and medical school with this intent, and

That a copy of these resolutions be mailed to every medical school in the Western Hemisphere, to the offices of the embassies or ministries in Washington, D. C., of every country in this hemisphere outside of the United States, and to the Department of State of the United States Government.

Yours very sincerely,
American Urological Association
Thomas D. Moore, M. D.
Secretary

MISCELLANY

THE KENNY TREATMENT 19 YEARS AGO

In 1923 the *Journal of the Kansas Medical Society* published three articles on the subject of the treatment of anterior poliomyelitis written by Drs. William C., C. F., and Karl Menninger. At the time of the publication of these articles an epidemic of this disease had swept Topeka. The treatment as described in Dr. Karl Menninger's article coincides closely with that used in the Kenny Treatment, now accepted by the National Foundation for Infantile Paralysis.

—*Conn. St. Med. J.*

RUPTURED INTERVERTEBRAL DISKS

The term "lumbago" is rapidly falling into disuse as a nondescript designation for ill-defined pains in the lower spinal region. Unknown as an entity but twelve years ago, ruptured intervertebral disks are recognized today as the cause of a remarkably high percentage of hitherto intractable and incurable low back pains and sciaticas. Neurosurgeons have now precisely defind the symptomatology and pathology, and perfected an operation technic that not only relieves but cures virtually all back disorders in this category.

The symptoms are low back pain in recurring attacks, some very severe and disabling, the pain radiating down the posterior aspect of the legs. An interesting as well as a diagnostic feature is the intensification of the pain on sneezing, coughing, and straining of the abdominal musculature. The spine is stiff, relatively inmobile, for movements aggravate the pain. Laségue's sign is usually positive. Neurologic manifestations must be carefully sought, as the Achilles reflex, and occasionally the knee jerk, may be diminished or even absent. Sensory disturbances are not uncommon, consisting of hypoesthesias of a segmental distribution, and paraesthesias. Previously, contract media

were used to localize and demonstrate the lesion radiologically, but this procedure is now deprecated, for extensive investigations have demonstrated that 96 per cent of these cases are situated in the region of the fourth and fifth lumbar vertebrae. This significant finding obviates the necessity for contrast x-ray studies, with the attending disadvantages. Needless to say, pelvic, rectal, and neighboring osseous pathology must be excluded before a diagnosis of ruptured intervertebral disks can be safely made.

The operative technic has been simplified so that the original bilateral laminectomy has been replaced by a method in which the neural arch is either preserved or untouched, with rare excpetions. After adequate exposure, the necrotic interverbral disks, the result of trauma and not of infection, are curetted. In about 25 per cent of the cases the necrotic interverbral disk does not protrude and hence is not easily visible, but is concealed and must be searched for and emptied. Not all of the patholigic disk need be gouged out, but free egress for its ultimate protrusion should be provided, as in the adequate opening and drainage of an abscess. After the operation, a brace should be worn for three months. Recurrances are unusual after operation, so that once a cure is attained it may be regarded as final.

A crippling and disabling ailment is now amendable to surgical therapy. For those who habitually suffer from agonizing back pain with sciatic symptoms an avenue of cure is now opened. As in all disorders that cause disability and painful inefficiency, the cure of ruptured intervertebral disks will not only make many persons happy but will also make them more useful.

—N. Y. State J. M.

These dear days

The maintenance of our population's health is hardly suitable object of mirth; and yet without mirth, how can any doctor sit through the antics of past and present lay advisers on medical matters to the public and its political strong-arm men? The newspapers have it that there is to come shortly an "allocation" of morphine, codeine, etc., to the hospitals and the doctors. Won't those responsible, please send along instructions on how then the "dose" of these pain-stilling drugs may be made to work in half portions? Without wishing worse luck to the personnel of these rationers and commissioners than is the lot of ordinary mankind, we do hope that the average rain of stones from the kidney into the ureters will not miss their section when the allocation has gone into effect.

New York's Podesta, the Fiorello, too, has gone medical. His legal mind and the power of his office have come to conclusion on what might be right distribution of the nitrogen reserves present in meat. In a radio talk he advised his public to "start adjusting itself" to its weekly allowance of two and one-half pounds of meat—purely voluntary now, compulsory shortly, if you don't watch out. Meat, to the mayor, means beef, veal, pork, lamb and mutton. This crackdown on the New Yorkers, is, therefore, not going to make the Westerners weep at once, for the East Coast can still get fine sea fish on that meatless Tuesday, when we must double up on the cat fish of our Fridays. He has pretty statistics to prove that U. S. A. is going short in beef, mutton, etc., but that is not where the joke comes in. It lies in the allocation of two and one-half pounds of meat to everybody over twelve; to everybody under six, a third of this, namely, three-quarters pound. Well, let's see what this legal fiat amounts to in nutritional justice.

These modern Sunday-school idealisms have legislative precedents behind them that are years older. What was the quality of the lay brains that made six or eight or ten dollars a week the minimum wage? Or that which, to within the last year, declared adults entitled to a $1000 exemption from income tax and "minor" children $200 each? The biological purpose of the minimum wage is the assurance to every worker of sufficient funds to keep him physically fit and warm, something obviously not definable in dollars but in the "value" of those dollars in the district in which the subject lives. ("Economics" was invented of the Nordic blondes and is unknown o the South Sea brunettes, where even the children need only to pick a banana off the tree.) And where is the justice or the injustice of the income tax laws? All these trials at legalization purpose, of course, a coverage of what are the minimum standards for *maintenance* of the human form divine;

which is another way of saying, its *sustenance.* In temperate climes the matter then drifts down to the financial possibilities of getting enough to eat, which in scientific terms means (a) adequate grams-protein per day, (b) adequatt calories. And that's where another smile comes in. It is the grams-protein that are the inescapable food needs of the day; and the costly ones. Here are the facts: papa and mamma each require 113 grams for their maintenance; but little booby, who is twelve, needs exactly as much; with the one-year-old precious eighty percent hereof. How's the old man, allowed a thousand for himself to meet the gaff of the kids with only twenty percent?

* * *

Continued story

This urge on the part of laymen, of reformers, of legislators to tell the medical profession how it must conduct itself in its eternal effort at killing its own business while keeping a public well and happy for as long as possible, brings back a memory—that of the days when we were guarded about by the "noble experiment" and assaulted by hi-jackers and racketeers. These paragraphs do not argue for or against prohibition, but they do make note of what happens whenever lay organization strong-arms medical practice.

There existed in 1917 (as now) many doctors who believed that the alcohol in their kits had definite therapeutic applicabilities. But were they left alone to pursue practice as their intelligence and their conscience dictated? Not at all! If the crusaders by prohibition could bring heaven to earth for the general public, did that not include the doctors? Federal statute did exempt the doctors to the extent of sixteen ounces of hard liquor in any ten-day period for their ill. Pondering the law, Ohio legislators decided that if sixteen were good, eight would be better; and the solons of Indiana, that none would be best.

All right!

It was in this lovely state of Indiana that at the end of a lovely autumn day my doctor friend asked me to hold his hand. He felt desperate because his patient upon whom he had done a double cataract operation in the morning was "vomiting his head off." Reviewing the situation, it was obvious that the patient was cocaine poisoned, and I suggested two stiff jiggers of whisky. The doctor almost burst into tears. "I'm not allowed to prescribe liquor in this State," he informed me. "Write to the Governor tonight," I urged him, "that you have produced a new candidate for the blind asylum because the State insists upon interference with your practice."

—Cin. J. of Med.

ANTI-CANCER — "N"

1. Primitive races eating freely of visceral organs as well as muscle meat, have very little cancer.

2. Civilized white men, limiting their flesh diet practically exclusively to muscle meat, have a high cancer incidence.

3. The cancer rate of primitive races increases as visceral meat is decreased in the diet.

4. Cancer is probably a dietary deficiency disease due to absence of some constituent of certain visceral organs. From the investigations of others it appears that this constituent is most abundant in brain and stomach tissue.

5. Therefore, to prevent cancer, one might conclude that brain or stomach tissue should be added to the diet.

6. The name "Vitamin N" is tentatively suggested for the cancer inhibiting factor.

Ill. Med. J.

FOOT BATHS FOR "ATHLETE'S FOOT"

In Queries and Minor Notes in *The Journal,* June 27, it was stated that a "satisfactory formula for a good powder for use in the treatment of trichophytosis is sodium tiosulfate 6 Gm. and boric acid 24 Gm." I first described foot baths and this powder formula for this condition in The Journal, April 18, 1931, page 1301, and Oct. ., 1931, page 1020. It is highly important to endeavor to eradicate as much as possible this most disabling of all foot infections. With this in mind I shall enumerate some of the advantages of both the powder and the bath.

1. The Bath: The sodium hyposulfite bath is stable. Chlorine, for example, is not. Chlorine too is an essential war chemical best used elsewhere.

My "hypo" bath can be made in any handy container: wood, metal, tile, in fact any material. The chlorine bath needs a rubber container. Many thousands of these rubber containers now being used for foot baths could be

turned in for war effort where rubber is so much more needed. Thus two war essentials, chlorine and rubber, could be salvaged.

The making of the "hypo" bath is not a procedure of chemical precision. Although I have recommended a 10 per cent "hypo" bath, I have also described that anywhere from 3 per cent up is effective. Even a very concentrated solution, though not necessary, is harmless to the skin.

Ordinary "hypo" crystals, the large commercial type, in fact the "hypo" of photography, is the kind used for these baths. The crystals are much handier and more readily transportable than the unstable 0.5 or 1 per cent chlorine solutions. Many institutions have found success with the following crude but very practical method: Use any container large enough for the immersion of both feet. Add water to reach the level of the ankle. Throw a handful or cupful of "hypo" crystals into the water.

Where the "hypo" bath is near a chlorinated swimming pool the chlorine content of the pool is not affected (*The Journal*, Oct. 3, 1931) particularly where an automatic chlorine content regulator is used.

2. The Powder: The powder may be in bulk or packaged in handy sifter top containers so as to be ready for use anywhere.

Solutions are good for the feet and floors only but not for the footwear. The powder is good for all three. The footwear, which harbors the trichophyton organism, is the common cause of infection as well as reinfection.

The powder need only be sprinkled lightly on the foot and footwear but more heavily on the floors of the showers and locker rooms. It is necessary to throw only a handful or cupful of this powder on the threshold leading from the showers to the lockers. By this simple expedient with the powder or, as before mentioned, by throwing a handful of the "hypo" crystals into the foot bath, we have effective means of combating this skin disease.

To be ideal, foot hygiene should be applicable and efficacious all the way from the home guard and the rear guard to the front line trenches. Keeping a soldier on his feet is paramount. It is therefore of greatest importance that this most prevalent and most disabling of foot diseases be conquered. That we have such simple means to do this under such varying conditions should be taken into consideration by all physicians caring for our civilians and fighting forces.

W. L. Gould, M. D., Albany, N. Y.
—J. A. M. A.

ADVANTAGES OF PLASMA

The greatest single advantage is the immediate availability of an effective substitute for whole blood. There is no problem of obtaining donors. Syphilis and other communicable diseases have been ruled out by previous laboratory tests. Typing has been found to be unnecessary before the transfusion of plasma. Minutes and even hours are saved by having available such an effective substitute for blood. Once the indication for its uses have been established, the transfusion should and can be started on the patient within five minutes.

Another advantage is that blood plasma may be safely stored in the refrigerator for many months before use. Our longest period of storage before use was six months. It may be kept even longer.

Still another advantage is that a plasma transfusion is an extremely simple and safe procedure. No more apparatus is required than for an ordinary infusion of glucose or saline. Although ordinary plasma should always be filtered before administration, the filter can easily be incorporated in the tubing used for the transfusion.

The infrequency of reactions and their evanescent character make it an extremely safe procedure. Reactions following a plasma transfusion are the same as those following the administration of whole blood. There may be chill, fever, urticaria, nausea, vomiting and respiratory distress. One should proceed more cautiously in administering plasma to a patient with fever or with low serum protein because the incidence of reaction in these two groups is higher.

—Ohio St. Med. J.

' There is nothing at present to indicate that the use of fortified oleomargarine in place of butter would lead to nutritional difficulties," Madeline Day, Wilmette, Ill., declares in *Hygeia, The Health Magazine* for January. "Butter," she continues, "may contain certain

nutritional factors not yet fully identified. The public has a right to insist that butter and oleomargarine continue to be marked so that each is easily distinguishable. For the rest it is a matter of taste and purse. Certainly oleomargarine can be purchased less expensively than can butter, and it takes a keener taste than most of us possess to distinguish between them by taste alone."

The question of the comparative nutritional value of oleomargarine and butter is particularly important today because of the war, she says, pointing out that "when every 10 cents saved buys a war stamp, when every man inducted into the service lowers the buying power of some family, when every camp established or every ship loaded with lease-lend supplies draws from our national supply of butter, women are beginning to ask seriously what would be the effect on the family health if oleomargarine was substituted for butter. . . . For that is something America cannot afford—to substitute a food which might be detrimental to the health of the American people. . . .

"Briefly, butter is a food product made exclusively from milk or cream or both and containing not less than 80 per cent, by weight, of milk fat. It may or may not contain common salt or coloring. Oleomargarine is a food product made from either animal or vegetable fats or a combination of the two. These fats are mixed, cream, skim milk or dried milk and water. The finished products must contain not less than 80 per cent fat. Since the fat content of both foods is controlled at not less than 80 per cent, such difference as there may be in the two products can be attributed to the type of fat used rather than to the fat content. . . ."

The type of fat used in making oleomargarine has changed during the past few years. Mrs. Day points out. It will probably continue to change—depending on the availability of different oils. Nearly ten times as much cottonseed oil is used today as was used ten years ago, and the use of soybean oil has increased until it now furnishes about one third of the total oils used. Soybean oil is reported to be more easily obsorbed than butter fat and is regarded as superior for this reason in infant nutrition, she says.

Since the manufacture of oleomargarine was first legalized (1886) until the present time, the product has been consistently taxed. Thus the federal government has made it possible for the consumer to distinguish between butter and oleomargarine.

"In earlier days the importance of this distinction was not clear," the author states, "but by 1913 it was evident that while butter was a rich source of vitamin A, vegetable oils and many of the animal fats used in making oleomargarine were devoid of this vitamin. Thus to substitute oleomargarine for butter at that time was to decrease the vitamin A intake. However, it is now possible to fortify oleomargarine so that its vitamin A content may equal that of high grade butter. . . . There is no significant difference in the digestibility of butter and oleomargarine. These foods are also a source of essential fatty acids. Natural fats differ in the amount of unsaturated fatty acid present. These highly unsaturated fatty acids are important in our diet, but so far as has been determined, oleomargarine seems to supply this requirement as satisfactorily as does butter.

"Butter is an important source of vitamin A. It is not a particularly rich source of vitamin D, but with generous use it may supply one sixth of the total requirement of an adequate diet. Oleomargarine can be compared with butter as a source of vitamin A only when it has been fortified with this vitamin, but . . . about 85 per cent of the oleomargarine now manufactured is so fortified. . . . Oleomargarine supplies more vitamin E than butter does."

"THE MEDICAL CURRICULUM"

There is much mental food in an editorial under this title in the August 15 issue of the *British Medical Journal*. One senses that medical educators in England have been as violently disrupted in their thinking as in their physical plants and activities, but that they are beginning to pull themselves together and to look into the dark corners now illuminated by the wartime searchlights. One also senses that great and inevitable changes in the training of physicians are close at hand. A system that has been dominated by scientific investigators and successful consultants is producing too few general practioners; it must turn back and concern itself more intimately with the knowledge and bodily skills required by the practicing doctor. At the same time, it might ac-

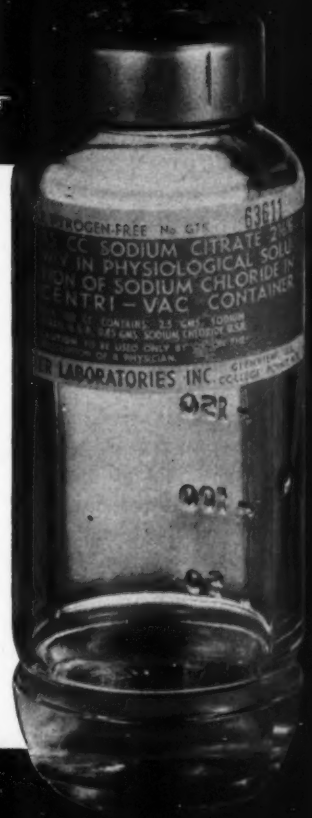
Milestones in Medical History

6

1940

THE *Baxter* CENTRI-VAC

FOR MAXIMUM PLASMA YIELD



Economy as well as safety . . .

is essential to the success of any plasma bank program. That is why the introduction of the Baxter Centri-Vac in 1940 was such an important contribution to plasma therapy. It made possible the centrifugation and sedimentation methods of plasma preparation with all the advantages of the Baxter closed technique ☆ The Centri-Vac has Baxter's mechanically induced vacuum protection, Baxter's tamper-proof seal and closure, and uses Baxter's interchangeable accessories, thus bringing Baxter features of safety and convenience to the preparation of plasma or serum ☆ *The Centri-Vac, as an integral part of the Baxter technique, combines maximum plasma recovery with maximum safety and uniformity.*

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quire some of the methods of selection and training that have so markedly accelerated the acquisition of industrial skills during the war. The application of these changes should be integrated with a social and economic structure that will permit young men and women to marry freely at the age of twenty-three or twenty-four years; otherwise, the best stock may tend to be bred out of the race. Thus, the writer develops a rough outline of what the future British medical curriculum should provide for.

This startling revelation about medical education in Britain applies as well to the United States. Recent and present graduates are finding themselves a world whose ideals and demands are proving very different from those of the schools in which they were trained. Often, the information they most urgently need was not emphasized in their undergraduate courses. The historical, and on that account obscure, fact that smallpox can be prevented by inoculation, for example, might these days become a primary piece of knowledge in an island garrison. The neglect of preventive opportunity of any sort will soon cease to be an omission; it will become an error of commission. Graduates in army practice will wonder why they were not taught this in medical school. The lungs with cavities, the livers with lumps and the various advanced degenerations of the retina may still provide teaching material, but they are not the stuff of which medical practice has been or will be made. They are the gross, the rare, the allegedly interesting, and contrast sharply with the trivial but common deviations that occupy most of the practioner's time. As time goes on, the practioner will want to know less about the museum and more about the conditions under which men should live, eat, sleep, work, love and play. How can they be taught to appraise these things?

How indeed? Certainly not by changing the curriculum, although that may well accommodate itself to the interests and activities of those who are currently responsible for it. The world of today is moving into the hands of those who are active, dynamic, decisive—the "motor minds." These people have always eschewed the deliberative, scholarly and somewhat cautious impulses that have built the academic past. As they now come into power, they may well change the facets of the medical-school curriculum, and polish them too, but whether the product can thereby be changed is another matter.

The constitutional pattern of a person may be either in harmony with or antagonistic to the environment in which he is called to function, and his performance consequently may be good or poor. Or more happily, he may posses an adaptable constitution, which will allow him to function well under a variety of conditions; this has always been the constitution of the good general practitioner, and has proved to be his great value in war. Britain has repeatedly called for general practitioners, not for specialists. An improved selective process, or series of processes, by which such persons could be screened away from the brilliant performers in narrow fields would make the greatest contribution to our systems of premedical and preclinical schooling. If it could have been applied to the prewar student body, there would be less indication for postwar revision of the medical curriculum.

—*N. E. J. of Med.*

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MEDICAL LICENSURE

The Federation of State Medical Licensing Boards has upon its shoulders at the present time a great responsibility.

The current wartime problem of the redistribution of physicians brings up for study the whole structure of medical licensure and education. "Some thousands of physicians," says the *J.A.M.A.*,[1] "have already indicated to the procurement and Assignment Service for Physicians, Dentists, and Veterinarians their willingness to be 'dislocated' for the duration of the emergency to meet the needs of the civilian population." A survey of the laws regulating the licensing of physicians in various states has been undertaken by the Federation with a view to the adoption at the earliest possible time of new laws or modifications of existing regulations with the purpose of meeting the speeded process of medical education.

"Clearly," says the *J.A.M.A.*, "the processes of licensure must be geared to meet this emergency." Administratively much can be done to meet the situation. It has been suggested that the granting of temporary permits to practice on an interstate basis for the period of the emergency might be a means of meeting one of the most crucial problems; namely, the relocation of physicians to meet industrial and civilian needs. It has been reported that the Attorney General of the United States has suggested that licensure laws might be invalidated for the period of the emergency, also that state legislatures might immediately pass enabling legislation for such invalidation. Since the legislatures of forty-four states will meet in 1943, additional legislation might well be considered at this time.

A word of caution seems necessary. At this writing[2] the Army and Navy have just announced their plans to mobilize 200 to 300 colleges and universities for training men in the armed forces. The significance of this procedure on American liberal education will undoubtedly be profound, and its consequences with respect to medical education will be disturbing, to say the least. No one expects that we shall come through this war without scars. But the standards of premedical and medical education and practice cannot be too greatly modified without, in our opinion, appalling disservice to the living and to the national war effort. Unless one

[1] J.A.M.A. 120: No. 12: 925 (Nov. 21) 1942.

[2] December 18, 1942.

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visualizes medicine as merely a technical study in the delay of death and not as a contributor to the art of living, standards of practice and of learning do matter.

"Several efforts," says the *J.A.M.A.*,[1] "have been attempted to break down the standards of medical education and medical care and to bring into the practice of medicine half-educated physicians. . . ." We do not believe that the good common sense of responsible administrators backed up by the sound horse sense of the American people whose very lives and health are at stake would tolerate for long any such efforts at a time when our national existence is under serious extraneous threat. We could not conceive of any subtler sort of sabotage of our domestic health and morale. It is, of course, possible that certain minority groups may attempt to use the dislocations and changes which are the inevitable concomitants and consequences of a total war for their own ends. In so far as these ends are not in th actual public interest, we do not believe they will prevail.

As evidence of the sound common sense of the Federation of State Medical Boards, we list below the principles underlying proposed legislation to authorize and provide for the temporary admission to practice of physicians and dentists during the war emergency. These principles were derived from a joint meeting of the F.S.M.B. and the P.A.S.:

STATEMENT OF PRINCIPLES TO BE RECOMMENDED TO THE RESPECTIVE STATE BOARDS OF REGISTRATION AND EDUCATION IN MEDICINE AND DENTISTRY

1. The need for relocation or assignment of physicians or dentists shall be determined by the Directing Board of the Procurement and Assignment Service with the aid of the State Committees of the Procurement and Assignment Service and other agencies and on agreement with the State Boards of Registration and Education in Medicine and Dentistry.

2. These needs shall be met as far as possible by the relocation of physicians or dentists holding licenses within the State.

3. Whenever possible, needs shall be met by taking full advantage of existing provisions for reciprocity between the states and interstate endorsement.

4. Whenever existing laws make impossible the granting of temporary certificates, state boards should recommend to the Governor and to the state legislatures the earliest possible enactment of the bill designed to make possible the utilization of physicians and dentists under temporary certification.

5. When existing measures for relocation of physicians or dentists prove inadequate, State Boards of Registration and Education may request the Directing Board of the Procurement and Assignment Service to certify to them the names and qualifications of physicians and dentists who have volunteered or who may be otherwise available for relocation, at which time also such names have been sent to the State Boards making such requests.

6. The physician or dentist who accepts relocation shall agree to assignment to the specific area in which services are required and to acceptance of a certificate which limits the duration of such service to the period of the emergency and for such additional time as the State Boards may prescribe.

7. In view of the emergency character of this action, the Committee representatives, the Directing Board of the Procurement and Assignment Service, and the Federation of State Medical Boards of the United States recommend that fees for such certification be waived or reduced to a minimum.

This seems to be a practical approach to the instant needs of the country for medical service. We do not doubt that a similar practical approach will be made to the problem of premedical education, at the moment seemingly threatened by military necessity.

—*N. Y. ST. J. MED.*

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BOOK NOTES

L. O. DUTTON, M. D.
(Book Review Editor)
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WHEN DOCTORS ARE RATIONED: By Dwight Anderson, Director of Public Relations, Medical Society of the State of New York; and Margaret Baylous, Therapist, Charleston General Hospital, Charleston, West Virginia. 255 pages. Coward-McCann, Inc. 1942. $2.00.

This is one of those "how to" books. The authors state that they intend to take the reader through a general review of the varied facets of the physician's way of life before telling him how to make choices regarding the selection of a physician when he is needed. To that end certain various interesting chapters are devoted to information concerning the training and education of the physician, the various hedges placed about him by society at large and the varied ways in which he becomes qualified to practice either general medicine or a specialty. There are chapters regarding quacks and charlatans and how to recognize them and avoid them. Some of the more glaring fallacies in the armament of the quacks are exposed.

Per se this book is not simply an indictment of quackery, yet the intelligent reader must surely finish the volume with a better understanding of irreconcilable differences between scientific medicine and the filthy little pretender with his neon sign out in front. This book is well written, is interesting and informative. The only trouble about it is that too few peopeople will get it in their hands for the reading of it. The problem of how to choose one's doctor is clearly outlined and the answer is available for all who can read.

—*M. P. S.*

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